

LOADSTAR LETTER #27

October 1995 companion newsletter for LOADSTAR #137, the world's longest running C-64 magazine

CMD Does It Again With C-64 10/20 Mhz Accelerator Duo

240995 East Long Meadow MA. Jeff Jones. This is not a rumor. Mark, at Creative Micro Designs, has been locked away for months now, tinkering with different configurations of what any Commodore user would call *the* dream attachment for their 8-bit computer. CMD is putting the finishing touches on two accelerators for the Commodore 64.

Scheduled for release in February 1996, the *Super64 CPU*, the units are designed to be inserted into the cartridge port of a C-64 or C-128 in 64 mode. The units are expected to sell for \$149 and \$199 for the 10MHZ and 20MHZ models respectively.

Once inserted, the accelerator, which is actually a self-contained computer system, takes over, using the slower console only for its keyboard, sound, IO and video capabilities. The *Super64 CPU* has its own 64k of fast static RAM.

The accelerators come with a pass-through port, making them compatible with RAMLink and REUs. CMD also points out that the accelerators are GEOS compatible right out of the box. CMD will entertain the notion of developing a similar C-128 mode accelerator, but would like to sample the demand first. Please don't flood CMD with calls. If you do, I wouldn't be able to get through to them and get scoops like these! Also CMD only has so many phone lines and a business to run. Please write or fax CMD with your vote of confidence, suggestions about their accelerators. Don't call. Their address and fax number is on the back page in their advertisement. □

GeoFAX Shipping

by Jeff Jones. *Click Here Software* has released Maurice Randall's much touted and sometimes doubted GeoFAX. The wait is over. GeoFAX is vaporware no more. In fact LOADSTAR has three copies of it, and CMD is distributing it.

GeoFAX is a GEOS program that allows Commodore users to use a Hayes compatible fax modem to send and receive faxes through their computer. A modem of at least 9600 bps id preferred, and these days it's difficult to find a new modem slower than that. GEOS 64 2.0 or GEOS 128 2.0 and SwiftLink, from CMD are also required.

One exciting use of GeoFAX is that it can be connected to a real fax machine. This transforms most any fax machine into a GEOS mode sheet fed digitizer.

GeoFAX works with two kinds of graphics: GeoPAINT documents and FAX documents. It can receive a fax from another fax machine and convert it into a GEOS document or take a GEOS document and send it as a fax document. It can also receive a fax, store it verbatim, and forward it to another fax machine -- or another GeoFAX user.

You can leave GeoFAX running and set for auto answer, in which case you have a silent fax machine that stores the faxes on disk rather than paper.

GeoFAX can print at a higher resolution than GEOS would normally print. So you'll loose no resolution in your printouts unless you have a less than decent printer. If you have an MPS 801 or 1525 type printer, you'll have to take your faxes, convert them to GeoPAINT documents, and then use GeoPAINT to print them. GeoPAINT throws away pixels since even a regular GeoPAINT document is too wide for these Jurassic 60dpi printers. If you have 9/24-pin printers, GeoFAX will do a better job of printing than GeoPAINT since it handles 360dpi.

When converting a fax to a GeoPAINT document, there are four dithering and contrast algorithms that allow you to create the type of document you want. □



So how Fast Is a 10/20MHZ C-64?

by Jeff Jones. Commodore computers are notoriously slow, not for their computing speed, but for their slow drive access due to a pennies-per-unit decision by a Commodore board cheapskate. CMD has done a decent job of compensating for the fruit of Commodore's cheapness with JiffyDOS and their own secondary storage devices.

But the C-64 isn't a very slow computer. If it were, you'd have stopped using it long ago. When we say MHZ, we mean millions of cycles per second. A C-64 out of the box runs at a little faster than 1MHZ. Believe it or not, a C-64, at 1 MHZ is very fast, mainly because its microprocessor is extremely efficient, with an average instruction time of about 3 cycles. So on average, a machine language program (which includes the BASIC interpreter) can do one thing in about 3 millionths of a second. This includes arithmetic operations that can consume more than a hundred cycles on other computers. Newer computers get around their inefficiency by cranking up the cycle speed (though Intel has taken some very interesting alternatives

Inside! ➔

- Internet 101 Part 2 with Jim Brain
- How to Compile complex programs
- News! Letters to the editor and more!

Copyright 1995 by Softdisk Publishing. LOADSTAR is a monthly "magazine on disk" for the Commodore 64/128. Subscribers receive two 1541 disks (or one 1581 disk) in their mailbox every month filled with news, articles and programs. These non-PD, high-quality programs. Subscription prices are \$69.95 for a 12-month subscription or \$19.95 for a 3-month subscription. You may also elect to subscribe "by the month", where we charge your credit card \$7.95 for each issue after it's shipped. The Loadstar Letter is published monthly by Softdisk Publishing as a companion to LOADSTAR and LOADSTAR 128 Quarterly. No part of this newsletter may be reproduced without the permission of Softdisk Publishing. Newsbytes stories are licensed from the **Newsbytes News Network**, and are exclusively copyrighted by Newsbytes. Softdisk cannot give permission to reprint Newsbytes articles. LOADSTAR LETTER contacts: INTERNET: LOADSTAR@GENIE.GEIS.COM Genie: LOADSTAR US MAIL: ATTN Jeff Jones, Softdisk Publishing P.O. Box 30008, Shreveport, LA 71130-0008 318/221-8718. Fax 318/221-8870. BBS 1-318-425-4382. Leave feedback or email "Jeff Jones" 2400/8n1. N.I.S.S.A.

with the P6) which is like flooring a car in low gear. Sure, you're going fast, but you're doing it inefficiently -- and you're overheating.

So is a 25MHZ 386 faster than a 20MHZ C-64? In a word, *no*. the 20MHZ C-64 pulls 10 MIPS (millions of instructions per second) while the 25MHZ 386 pulls 8. But there's more to it than this. Since the C-64 is only managing 64K of RAM, and any program or data is going to be smaller than that, it doesn't have to do as much work as a DOS computer. So things get done faster than you'd think

As with other accelerators, all communication with the slower computer system is done at the original computer's speed. So processing is done at accelerated speeds, but disk access, video manipulation and the like are all done at the 1MHZ speed. Still there is a significant speed increase. First the units come equipped with JiffyDOS, which enhances disk access. Since I have used a 4MHZ accelerator with JiffyDOS on a CMD hard drive, I can vouch that accelerators increase disk access speed over and above the many benefits offered by JiffyDOS. Disk access for Machine language programs probably won't increase significantly, but when dealing with BASIC programs, compiled or not, expect an incredible increase in speed.

The drive always writes at the same speed, but the program that's sending the data may be slow. Generally, a BASIC program will write a file to disk much slower than a disk drive can accept the data. Luckily most BASIC programs don't have a lot of data to write, so the laborious task is over before your beard begins to grow. But if a BASIC FOR NEXT loop processes and sends your data file 10-20 times faster, it may be enough to push the outflow of data to ML SAVE/LOAD speeds.

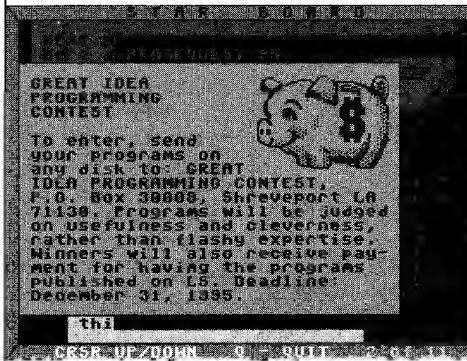
I haven't seen the 10/20MHZ C-64 in action yet, but I have used a 4MHZ C-64, and frankly it was sometimes too fast for testing and programming. If you can believe it, the screens on my 40MHZ Amiga pop up slower than a BASIC program LISTs on a 4MHZ C-64.

Don't worry though, many of your old games and programs won't be over before you know it because the hardware timers in the computer will keep the same time. Of course a program that doesn't rely on hardware timers may seem pleasantly faster in some routines, and too fast in others. But generally faster is always better in my book.

The New Star Board

Fender has instituted a new feature called Star Board, which is an electronic bulletin board for everything going down on LOADSTAR. If you don't read Star

Board, you may miss out on contests and events which may go unmentioned anywhere else, even in the Loadstar



Letter. For instance, did you know that there's another prose contest going on as you read this? So give Star Board a run every month and find out what's going on. □

Compiler Discussion And Secrets.

The following discussion comes from LOADSTAR's BBS, which leads to my own dissertation on how to compile programs that use ML and high memory.

By: JOE COMMODORE @ SLR
On: Fri Aug 4, 1995 7:08 AM

If you don't have a BASIC compiler this day and age, you should be looking out for one! BASIC compilers will take most BASIC programs (all with appropriate adjustments) and make them run many times faster... To do this it converts the program into either a P-code or into machine language. P-code is similar to ML but not as compressed. ML is as fast as you can get. I myself use Austrospeed-88, which is similar to the compiler BLITZ! published by Skyles Electric Works years ago... It compiles to P-Code and requires programs to be at the normal start of basic (2049 or \$0801 for techies.) There are ways to work around that. I also was able to get the Plus/4 version, one of these days I may use it.. :) Much of what I've done is hybrid combining compiled basic with assembly (ML), compiled basic for the rudimentary stuff, ML for the stuff that really needs to speed benefit. Haven't messed with 64 sound as much as I had with the PETs and VIC, nor sprites, mainly work with character graphics. Yes you can do character graphics and more with BLITZ/Austrospeed. If you have any questions in any of the areas I've mentioned above, I'll see if I can help you. Also I have a good reference for other Commie 8-bits from the PET to the P-500 (well, maybe not reference for the P-500, but I do own one...)

By SIR COMMODORE @ TOR
On Tue Aug 15, 1995 2:22 AM

I've compared Austrospeed to Blitz!, and they were both about the same speed; I really couldn't care if Austro is three seconds slower on a medium-size (50 block) program, and Austro is a bit smaller, making it easier to fit onto my crammed utilities disk. It was written to be Blitz! compatible, even with Deblitz. I haven't run across an Austro-compiled program that hasn't decompiled with Deblitz.

By SILENT @ COB
On Thu Aug 17, 1995 3:10 AM

Hey, learn ML. It is cool and amazing! I know it is hard to use and program, but the benefits outweigh its disadvantages.

By ROCKET MAN @ SFB
On Fri Aug 18, 1995 4:26 AM

I don't use basic compilers, or much of BASIC for that matter. However, I do use some software compiled from BASIC. My main complaint is that those programs cannot be made to work with RAMDOS. I guess the compilers just won't give you a free page in the right place. Which Basic compilers will produce software that works with RAMDOS?

By SIR COMMODORE @ TOR
On Tue Aug 22, 1995 3:38 AM
Subtopic: Compilers vs. ML

I know ML's the fastest, but have you ever tried to code a program that uses complex mathematics in it? Time for development is very important; I could have a program running in several minutes, and in ML you'd have just barely outlined your program modules. Look at Windows 95: by coding it in C++, Microsoft got it completed months and months earlier than had they coded it in assembly. ML's great, but there are certain situations where compiled BASIC is far more convenient and just about as fast. I program regularly in ML, but if I need a program to compute sines, I write it in BASIC (and compile it if necessary). If I use some math, the program starts out in BASIC; if it uses the disk, it'll be in assembly. □

Compleat News

There was a bug in The Compleat Print Shop volumes I and II that popped up only for multi-drive users. The bug only pops up if you change destination drives and then pick images from file #95. The product has been re-mastered and a fix will be published on Loadstar #138

The Compleat Programmer has been re-mastered with new tools, new text, and easier C=Hacking file printing. The Compleat Programmer is now absolutely crammed with tools and information. Megabytes and megabytes of it. □

LOADSTAR SOFTWARE VALUES!

The Compleat* Series

The Compleat PRINT SHOP I: (The Print Shop by Broderbund or Printmaster required). Over 1300 artistic and never before published PRINT SHOP images. The smart, fast software package included allows you to quickly scan through the many PRINT SHOP images sequentially, by name, or by group number. Press a key and save the graphic you want! In 2-block, 3-block and even PRINTMASTER graphic files! All that plus a printed guide to your new sea of graphic files. And if you like the first volume, you'll probably want to get your hands on **The Compleat PRINT SHOP II**, which also contains over 1300 PRINT SHOP images, previously published on LOADSTAR issues over the past ten years. Included is the same smart, fast software package included in The Compleat PRINT SHOP I. Each volume is \$20.00.



The Compleat Programmer: Become the Commodore programmer you've always wanted to be! Megabytes of knowledge crammed and stuffed onto eight 5.25-inch disks or two 1581 disks! Plus we include all the tools, extensions, languages, assemblers, tutorials and utilities you'll need to create the same type of software you see on LOADSTAR! This massive collection is way over two megabytes of instructional text and valuable tools. \$20.00. For \$5 more, get C= Hacking MAG, not available separately, to complete your programming set.

The Compleat Maurice: A compilation of 26 solitaire card games written by Maurice Jones, the acknowledged master of card game simulations for the C-64/128. There's even a brand new, never before published game called Boomerang. Two 5.25 inch disks or one 3.5 inch disk. \$20.00 postage paid!

The Compleat Dave: Two 1581 disks or three 1541 disks crammed with SID music. Over 250 classic melodies from yesteryear, arranged and transcribed by the Master of Music, Dave Marquis, and now they're available in one gigantic 8-hour collection. If you enjoy SID music, you owe it to yourself to get THE COMPLEAT DAVE. Two 1581 disks or three 1541 disks \$20.00 postage paid!

The Compleat Walt: Ten years of Walt Harned's slideshows and multimedia events gathered into one huge collection: Seven 5.25-inch disks or three 3.5 inch disks! Over 250 pictures, including some that have never been published. The greatest one-man collection of art on any computer platform! \$20.00 postage paid!



The Compleat Roger: 25 educational quiz programs, each carefully crafted by Roger Norton, an educator who uses C-64s. These programs come crammed on two 5.25-inch 1541 disks or one 1581 disk. \$20.00 postage paid!

* No, we didn't misspell "complete." Compleat is the ten dollar spelling of complete.

Other Products

Geopower Tools - 19 Geos utilities: Calendar Printer, Fast Format, Geo Fetch (grab any portion of a screen as a Photo Scrap), Phoenix (resurrect a trashcanned file), Programmer's Calculator are just a few of the handy tools. Side Two is filled with Clip Art (in Photo Album format) and fonts. \$9.95 (C-64/128) Item #080525

Songsmith - LOADSTAR's own music-making program. With this deluxe music editor/player you can easily transcribe music from sheet music or make up your own tunes. Songsmith comes with a slick 30-page manual and a jukebox player with eight tunes. \$9.95

Game Star #1 Eight games from LOADSTAR #70-#100. The Tenement, Stack 'Em, The Sherwood Open, Gems, Stealth Bomber, Eagle Eyes, Moonraker & Circuitry. \$9.95

Just For Fun - Eight original games. There are arcade games, educational games, puzzle games and just games that are just plain fun on this disk. \$9.95

Fun Four - Four original games. A huge maze game, trivia game, solitaire and a space shoot 'em up -- all runnable from a menu. \$9.95

Sport - In the early days of science, "sport" meant "mutant." This is a full novel on C-64 disk by author, Jeff Jones, about a murderous neo-human. Over 500 terrifying pages. Automatic presentation software included. Printing capability. Bookmarks. Warning! This is a real novel with strong content, frank language, violence and adult situations. If the hard-hitting action of real/sci-fi/horror novels turns your stomach, please don't buy this book. Must be 18. 1 CMD HD disk, 2 3.5-inch disks or 3 5.25-inch disks. \$5.95 \$1.00 Shipping.

Brainpower/Brainstorm - 80-column word processor and idea processor for the C-128. These two programs are together on one disk. It comes with a detailed 32-page manual. \$9.95 (C-128 only) Item #069421

Best Of Loadstar Compilations: LOADSTAR is over 11 years young! We have 5 anthology disks that take you through the evolution of LOADSTAR, from humble beginnings to the well-oiled machine we've become. If you want to hop on a time machine and go back, start with **The Best Of LOADSTAR #5** and move your way back to **The Best Of LOADSTAR #1**. Each of the 136 back issues are available for purchase with discounts on large orders for you collectors out there. Best Of LOADSTAR disks are available on 5.25-inch disks only. C-64 disk. \$9.95.

Master Base - Database of users' groups for the 80-column C-128. This is a fast, powerful database program for handling addresses and mailing labels (includes barcode printing). The disk also has a file of over 600 users' groups addresses. \$4.95 (C-128 only)

LOADSTAR is a monthly "magazine on disk" for the Commodore 64/128. Subscribers receive two 1541 disks (or one 1581 disk) in their mailbox every month filled with news, articles and programs. These non-PD, high-quality programs are written by the best home-based programmers in the field and edited by the crack LOADSTAR team of Fender Tucker and Jeff Jones. Subscription prices are at an all-time low of \$69.95 for a 12-month subscription, or \$19.95 for a three-month subscription. You may also elect to subscribe "by the month," where we charge your credit card \$7.95 for each issue after it's shipped.

Loadstar Products Order form 1-800-594-3370

Quantity	Description	Price	Item#	Total	Qty	Description	Price	Item#	Total
3-month	LOADSTAR subscription	\$19.95	na		TOTAL FROM LEFT COLUMN				
1-year	subscription to LOADSTAR	\$69.95	na			Songsmith	\$9.95	069525	
Month to month	@\$7.95	\$7.95/mo	na			Best Of LOADSTAR #5	\$9.95	049525	
Compleat Print Shop I	on 5.25-inch	\$20.00	0009D5			Best Of LOADSTAR #4	\$9.95	049425	
Compleat Print Shop I	on 3.5-inch	\$20.00	0001D3			Best Of LOADSTAR #3	\$9.95	049325	
Compleat Print Shop II	on 5.25-inch	\$20.00	0010D5			Best Of LOADSTAR #2	\$9.95	049225	
Compleat Print Shop II	on 3.5-inch	\$20.00	0002D3			Best Of LOADSTAR #1	\$9.95	049125	
Compleat Programmer	on 5.25-inch	\$20.00	0005D5			Masterbase	\$4.95	081025	
Compleat Programmer	on 3.5-inch	\$20.00	0005D3		SUBTOTAL				
Hacking mag	3.5-inch only	\$5.00	0006D3		Louisiana Residents add 4% sales tax				
Compleat Maurice	5.25-inch	\$20.00	0007D5		Shipping \$5.50 UPS Second day air. Pay no shipping if LOADSTAR				
Compleat Maurice	3.5-inch	\$20.00	0007D3		subscription or any product from the Compleat series is ordered.				
Compleat Dave	5.25-inch	\$20.00	070525		Total Enclosed:				
Compleat Dave	3.5-inch	\$20.00	070523		Payment method:				
Compleat Walt	5.25-inch	\$20.00	070425		<input type="checkbox"/> Check <input type="checkbox"/> Money Order <input type="checkbox"/> Visa <input type="checkbox"/> MasterCard <input type="checkbox"/> AmEx				
Compleat Walt	3.5-inch	\$20.00	070423		<input type="checkbox"/> Discover <input type="checkbox"/> Novus <input type="checkbox"/> Other _____				
Compleat Roger	5.25-inch	\$20.00	0004D5		Authorized Signature _____				
Compleat Roger	3.5-inch	\$20.00	0004D3		Subscriber's I prefer <input type="checkbox"/> 5.25-inch diskettes <input type="checkbox"/> 3.5-inch diskettes				
Geopower Tools		\$9.95	080525		Mail or Pay to:				
Game Star #1		\$9.95	080825		Softdisk Publishing				
Just For Fun		\$9.95	073525		P.O. Box 30008, Sausalito, CA 94965-0008				
Fun Four		\$9.95	073525		Questions: ☎ 1-818-221-8718 ☎ Orders: 1-800-594-3370				
Sport	5.25-inch	\$5.95	070325						
Sport	3.5-inch	\$5.95	070323						
Sport CMD High Density		\$5.95	070327						

TOTAL FROM THIS COLUMN

Abacus BASIC 64 Tips You've Never Heard

by Jeff Jones. BASIC 64 is quite a flexible compiler, far more flexible than any other Commodore Compiler I've used. But there are major aspects of BASIC 64 that are often overlooked even by advanced programmers.

First there are the two compilers themselves. There are two major differences between the two compilers:

Compiler I uses *real* (floating point) variables which range from around $\pm 1 \times 10^{40}$ (forgive me but my reference guide is at work as I write this so I'm only approximating here).

Compiler II uses integer variables by default, which only have a range of ± 32767 . Compiler II also allows the use of integers as FOR variables in FOR NEXT loops.

Compiler II is faster than Compiler I because it's dealing with integer variables, which require much less work in machine language. But it's only faster when it comes to math, FOR NEXT loops and any code which handles numeric variables. Compiler II will step through your code faster than interpreted BASIC, but it won't print to the screen any faster than Compiler I. It will POKE faster, but only when it's POKEing using a variable, not a literal.

The manual tells you not to use Compiler II if you don't understand the BASIC program. This isn't enough information. You shouldn't use Compiler II if you're going to use variables that may have a higher absolute value than 32768. You'll get an illegal quantity error if you do.

But sometimes Compiler I simply isn't fast enough, and you have large variables. You can get around the limit by declaring as real certain variables in your

program using the following directive:

```
10 REM@ R=I,J,K,L,M
```

Line 10 will make the variables *i*, *j*, *k*, *l*, and *m* into real variables, even when using Compiler II.

By the same token, you might be using Compiler I and decide that you

want to make only a few variables integers. The program may be a spreadsheet, which requires a lot of floating point math, or a graphics program. But key variables that aren't going to go above 132768! can be optimized by being made into integers, which will flow faster with the following directive:

```
10 REM@ I=I,J,K,L,M
```

Why some programs won't run.

Arrays must be dimensioned before *any* variables are declared. To simply GOTO a deeper line won't help. The compiler compiles your program line by line, and can't jump ahead that way. *It has to know about all arrays first.* These declarations must *physically* be stated before any variable is declared. Any variables declared on lines lower than DIM statements can be overwritten by array data.

Machine language won't work? Did you know that the cassette buffer is used to store variable data unless you use the directive:

```
20 REM @ S1024
```

That's right. The cassette buffer is in use. Not only that. Did you know that all of high memory is cleared when your compiled program is first run? So if your boot program LOADs fonts and ML and data into high memory before it LOADs and RUNs the compiled program, all of it can be wiped away in an instant Option E, *MEMORY-*

TOP, shown left, allows you to type in the highest address used by the compiler. This is better translated (from the German authors) as the highest address *cleared* when the program is RUN. This is an important concept to grasp. The

RAMDOS question brought up on page 2 can be addressed here.

Option F, *CODE-START*, raises the start of the compiled code. The compiled program still LOADs at \$801, and its runtime module extends about 19 blocks forward.. If you select F and then enter 10240, it leaves a gap from the end of the run time module (somewhere around \$1700) all the way to \$2800. This leaves room for you to load a font into your compiled program and stay in bank 0. In fact, you can even leave a gap large enough for a bitmapped screen, machine language and sprites. I call this sandwiching because you're placing data files in memory between the runtime module and the object code. Naturally I'm inclined to compress the finished program. Hopefully this discussion opens new possibilities for BASIC 64 owners. □

YOUR PRODUCT AD HERE!

Every month the LOADSTAR LETTER reaches thousands of active Commodore users. This is a perfect and affordable way to reach the customers you need for your product. An ad this size is only \$25. In the past we haven't sought advertisers. Now we're prepared to allow the newsletter to grow as large as it has to be.

Need some artwork? Layout is only \$5.00 additional! Send in your ad, scribbled on a piece of paper and see it laid out professionally in the LOADSTAR LETTER. Screen dumps or graphics welcome in many formats.

LOADSTAR LETTER:advertisments
Box 30008, Shreveport LA 71130-0008
Or call 1-800-594-3370
Email LOADSTAR@GEnie.geis.com

THE UNDERGROUND

The 8-bit, and now Laser Printed, Commodore Mini-Mag!

The Underground is a bi-monthly publication with articles featuring reviews, PD/Shareware, BASIC and machine language tutorials, Geos, telecommunications, international stuff, news and tips. The Underground is a publication created by people who refuse to let their 8-bit computers gather dust, and is priced low enough for even the most frugal users. Try a sample issue to see if the Underground is worth your while. You'll be glad you did.

Single Issue \$2.00
Can/Mex \$2.25 • International \$3.75
One Year (six issues) \$11.00
Can/Mex 12.50 • International \$21.50
All prices in US Funds

Send check or Money Order (US funds) to:

THE UNDERGROUND
4574 Via Santa Maria
Santa Maria, CA 93455
USA



You, Your Commodore Computer, and the Internet, Part 2: A Service Overview

by Jim Brain OK, the bell has rung and it's time to get into your seats. We have a lot of material to cover today, and I intend to get it all done by the time the bell rings. Last time I give out a bit of history on the Internet, an overview of the Internet itself, some uses, and the tools needed to access the Internet. This time we will delve in a little deeper into the various services available on the Internet. This should help you when researching the best way to access the Internet. A word of caution: At this time, shopping for Internet access is much like shopping for a used car. A little preparation beforehand on your part will help you steer clear of the "lemon" services.

An Internet Service: I see a couple of blank stares in the audience, so let us go over this term. Last time we defined the Internet as a vast amount of computer systems connected together with modems and phone lines. We also discussed the fact that even though the machines were physically connected, they didn't know how to "talk" to each other. So, a program called TCP/IP runs on each machine and handles the "etiquette" of computers talking with each other.

Now, the computers only lack something to talk about. Unlike your mother, who might call one afternoon to talk about "nothing," computers will only communicate when there is information to exchange. No problem. The Internet provides "services," which are the generators and retrievers of information. Think of an Internet service as the real useful part of the network. The service is what the user interacts with, and the service is what categorizes and distributes information we request. I know a number of you are asking what kinds of services are available on the Internet, so I will

touch on a few of them.

Electronic Mail: By far the oldest of the services, Electronic mail (or e-mail or email) predominates as the easiest service on the Internet. The concept is easily understood by humans. Anyone who has ever written a letter and mailed it to another person understands electronic mail as a faster form of the normal letter writing analogy. Each user on the Internet has an address (an email address), letters are written and mailed to a single person, users pick up mail at a mailbox, and replies, carbon copies, and signatures are options that a letter writer can use. As the century grows to a close, possessing an email address becomes more and more important. Some people, like myself, communicate almost exclusively via email, and most businesses, computer related or not, maintain electronic mailboxes. Due to its wide acceptance, ease of use, and age, most other services can be accessed through electronic mail. When researching for an Internet access provider, steer clear of any services that do not provide some form of electronic mail capability.

File Transfer Program (FTP): As soon as people started "talking" to one another on the Internet via email, they wanted to exchange data and files. Such objects could be transmitted via email, but email was optimized for small, textual pieces of information. Clearly a new service was needed to solve this problem. File Transfer Program, or FTP, was developed to make exchanging data files easier. Today, FTP is used primarily to publish and download freeware and shareware programs. As the Internet's file "transportation", FTP usage on the Internet accounts for a large amount of the electronic "traffic" on the Internet. If you are planning on downloading many of the free programs available on the Internet, be wary of services not offering FTP access. Some services will advertise FTP access, but what they actually offer is FTPMAIL access. FTPMAIL is a service that allows people with only email access to download files off the Internet. While very functional, and advantageous at times, it just isn't the real thing.

TELNET: TELNET is the way users on one machine on the Internet can log into another machine on the Internet. While very useful for people who have multiple Internet accounts or system administrators, TELNET is not as popular as the other protocols. However, for those who cannot access an Internet service through regular means, TELNET sometimes offer a workaround solution. Note that GOPHER and WWW can both be accessed via TELNET, so there is more than one way to access those services.

USENET newsgroups are the electronic "bulletin cork-boards" on the Internet. Each newsgroup has a theme and a set of topics to discuss. Some of the newsgroups discuss computer topics, while some cater to sports, hobbies, technology, science, and business topics. As with real bulletin boards, messages (called postings), are placed on the newsgroup and can be seen by anyone who looks at the newsgroup. Some special newsgroups allow the posting of binary files. Some people argue the usefulness and necessity of USENET access, so I leave it to you to decide how important this service is. For worldwide discussions on a wide variety of topics (including Commodore computers), the newsgroups can't be beat.

GOPHER is a newer service than most, dating back to only 1991. The name of the service is a legend in itself, for some claim the origin to be the mascot of the college that developed the service (The University of Minnesota), while others claim the name represents the service's task (Go-Fer this, and Go-Fer that). However the name was coined, the service allows the user to traverse through descending menus to home in on topics of interest. The functionality of GOPHER is enhanced by another, related, service called VERONICA. VERONICA allows the user to search the archive of all of the GOPHER servers (called "Gopherspace") for items of interest. GOPHER is an important tool for those who will use the Internet for research.

World Wide Web (WWW): The buzzword above buzzwords. Everyone is touting it, and everyone is scrambling to get into it. The World Wide Web is a service that brings multimedia to the Internet. The WWW allows information to be disseminated in graphical frames, called "pages", that can contain graphics, sound, and textual content. The WWW breaks from the monotype text display other service provide and provides support for different fonts and font styles, formatting options, and simple tables and lists. Perhaps the greatest benefit of the WWW is its ability to connect, or "link" phrases or words in a document, with other pages that cover the subject in more detail. Although the age of the WWW is not great, it has had a monumental impact on the Internet. Even though the WWW is not the single most important service available on the Internet, its popularity and ease of use is slowly moving it there.

An extra note about the WWW. Although the service provides the capability to display sound and graphics, as of yet, no program exists on the Commodore 8-bit computers that allows seamless display and rendition of the graphics or sounds objects.

Many other, lesser known services are available on the Internet. They are too

numerous to list here, and should not be a concern when researching for an Internet Service Provider. Nonetheless, if your chosen provider supports one or more of the lesser known services, so much the better!

A Note on Modems: If you are currently researching a possible modem purchase, let me help you get more confused (just kidding). As some of you may know, a Commodore computer can interface with a standard Hayes(tm) compatible external modem, in addition to the normal Commodore compatible user port modems. Nowadays, these modems have speeds ranging from 2400 bits per second (BPS) to 28,800 BPS. Obviously, the higher the number, the faster the modem, and that can translate into telephone and online connect time savings. As a rule, I suggest that new modem buyers not purchase a 28,800 BPS modem, due to their newness. At this time, 14,400 BPS modems are relatively inexpensive and very reliable. Although speeds slower than 14,400 are indeed acceptable, the cost savings diminishes rapidly as the BPS rate goes down.

As an added bonus, most of these modems now come with the ability to send and receive facsimile transmissions (faxes) when hooked up to a computer with fax software. Such software exists on the Commodore 64, called GeoFax. However, it presently only works with modems that specify they support the Group III, Class 2 (not 2.0) standard. Be aware of this if you want your new modem to do double duty as a fax machine.

Also, another caveat in modem purchases is the dreaded Rockwell Programming Interface (RPI) system. In order to cut costs, some modem manufacturers have removed some of the functionality of the modem and placed that functionality in a program that runs on the computer hooked to the modem. Although this is fine if the software runs on your computer system, no such software exists for the Commodore machines. Stay far away from RPI modems.

Now, a modem can do nothing until it is attached to your computer system. Let's spend a moment on the modem interface you may need to purchase. For Commodore compatible user port modems (1600, 1650, 1660, 1670, and clones), no interface is needed. These modems plug into the user port and the phone line. This is the easiest route to take, but there are a few disadvantages. All of the above mentioned modems are slower than 2400 BPS, in a world that thinks 9600 BPS is slow. However, for the beginning user, this may not be a problem. Just realize that downloads

from the Internet at this speed will be slow.

The next type of interface is called a RS-232 interface cable. Basically, it allows a Hayes(tm) compatible modem to be hooked into the user port, like the user port modems described above. The cable maps the pins from the user port to the correct pins on the modem, and changes voltage levels when needed. This cable can be purchased from many suppliers and is inexpensive. This type of interface allows you to purchase a Hayes(tm) compatible modem and attach it to the Commodore. There is a catch, however. Depending on the type of Commodore computer you have and the software you use to drive the modem, you will only be able to get speeds of 2400 BPS (C-64) or 4800-9600 BPS (C-128) out of the cable. Actually, the cable is not at fault. The fault lies in the computer. In order to cut costs, Commodore chose to emulate a very important serial driver IC in software in the VIC-20, C-64, and C-128. No amount of cabling can overcome this speed bottleneck.

To overcome the speed bottleneck, the computer must interface with a dedicated IC of some type. Enter the second type of interface: The serial interface cartridge. Two basic types of this interface exist. Basically, this cartridge plugs into the expansion, or cartridge port, and decodes the information coming from the Hayes(tm) compatible modem. The decoded information is then passed to the computer. This embodies the main advantage of such a cartridge. The disadvantage is software support. Not all telecommunications software supports this type of interface. Nonetheless, these are the two available interfaces:

SwiftLink from Creative Micro Designs, Incorporated.
(CMD) 15 Benton Drive P.O. Box 646
East Longmeadow, MA 01028-0646
(800) 638-3263 (Orders only) (413) 525-0023 (Information) (413) 525-0147
(Facsimile) cmd-doug@genie.geis.com
(Contact)

HART Cartridge Hatronics 195
Lincoln Avenue Montclair, NJ 07042
(201) 783-7264 Mark Hatten (Contact)

There is also a set of plans on the Internet to build a Swiftlink clone called the DataPump cartridge, but you need to access the Internet to get the plans to build the cartridge to access the Internet...

My next topic is the type of terminal emulation software (sometimes called telecommunications software), but the end of the hour is fast approaching, so I will hold that for next time.

Errata: Last time, I stated that America Online was not suitable as an Online provider, since they required that a special program be used to access their service, and that program is not available for the Commodore machines. That is still true. However, I have recently found out that Prodigy suffers from the same problem, and is also unsuitable as an online provider.

OK, I see the bell is about to ring. I forgot to have you hand in your assignment in at the beginning of class, so please hand in your 100 word essays to the assistant at the doorway as you leave. On the board is the assignment for next time:

Armed with the overviews of the major services available on the Internet, discussion with other classmates, information from local user groups, and your personal research, select an Internet Service Provider. If necessary, start researching terminal emulation programs. Possibilities include Desterm 128, Dialogue 128, and Novaterm 64. If possible, try to connect to your online provider. Come to class with questions on what didn't work.

NOTE: Term paper rough draft due in two months. Topic: The Internet's Benefits for Commodore Users. Length is 10 pages.

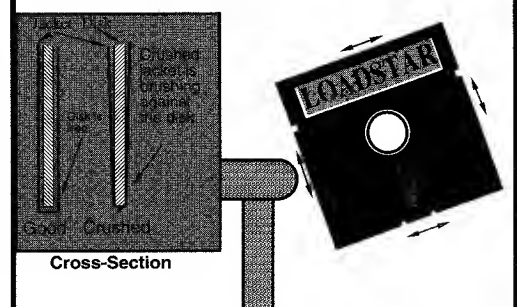
Until next class...

Jim Brain: brain@mail.msen.com



Disk Trouble?

Every copy of LOADSTAR leaves Softdisk as a verified okay disk set. 3.5-inch disks are virtually trouble-free because they are difficult to damage, even when mishandled. Unfortunately some 5.25-inch disks may become crushed in the mail and give READ ERRORS because they have trouble spinning. Fixing these crushed disks is quite easy. Just run the areas indicated along a hard edge such as a table. This should uncrimp the disk.



Letters To The Editor

Via LOADSTAR's BBS: 1-318-425-4382. Internet:
loadstar@genie.geis.com.

From: THE FEZ

I'm having a problem with my modem hanging up when someone call me while i'm online. I think it is because of my call-waiting. Is there a solution to this? Please help!

*Jeff: Usually call waiting can be disabled by dialing *70. So you can just prefix *70 to the BBS number when dialing from your terminal program. When you dial *70 there will be 5 short bursts of the dial tone to let you know that call waiting has been disabled. Contrary to popular belief, there's no need to pause and wait for all 5 dial tones. You can just keep dialing. But if you must have a pause before dialing the BBS, a comma will make most smart terminal programs pause though I do remember one program that used \$ for a pause command. Your call waiting is re-instated when your un-interruptable call is completed.*

From: FLYING FINGERS

How's it going down in Louisiana? Anyway, I'd like to tell all of you at the tower that you're doing a terrific job with the magazine. I look forward for every issue. I'd like to ask you a question. Is there any FAX software available for the C-64? I have a 1670 modem, 64c, 1541-II and a Panasonic KX-P1180i printer(Epson FX compatible). I think I heard of a 'geoFax' program but, if possible, I'd like one that was stand-alone.

Also, I've got a bunch of 6-pin serial cables (I mean a BUNCH). If you know anyone who's interested, drop me a line...

Thanks for the help...

JOHN MERJAVE

Phone:(718)/383-4136

Jeff: Normally we don't publish numbers, but there you go. geoFAX is shipped, and I'll be reviewing it soon. You'll need a FaxModem and GEOS. Your 1670 won't do. You can get geoFax and a fax modem from CMD, whose advertisement is on the back page. GeoFAX is made to work with CMD's SwiftLink.

From: EDWARD

Here's a Dialogue 128 logon script for LoadStar BBS:

```
w"LOADSTAR Connection ID Number."
w":": t"LSDxx"
w"LOADSTAR Connection Password."
w":": t"xxxxxx"
w"FIRST name :":t"YOUR NAME"
w"LAST name :":t"NAME"
w"AREA CODE :":t"000"
```

```
w"DIALING PREFIX :":t"123"
w"LAST FOUR DIGITS :":t"4567"
```

etc.

I have used X's to replace the personal information I use when logging on.

```
w"LOADSTAR Connection ID Number."
w":": t"LSDxx"
w"LOADSTAR Connection Password."
w":": t"xxxxxx":e
```

The small w, means wait for the following information. The small t, means transmit the following information.

```
t": is a carriage return
:e end of script.
```

This is just a small example of Dialogue 128 script. When I first logon, I do have to answer the first few questions manually, i.e, pressing the DEL key for color. But when I understand it better, I think I can write script to do all of the tasks.

I hope this information helps.

e.pacely@genie.com

Jeff: Thanks for the information. Doug Cotton mentions that he has a script for Dialogue 128 that he likes to use on GENie. He speaks very highly of it.

From: FLYING FINGERS

Howdy once again! I just tried to post on the National Marketplace SB and it rejected me. I just wanted to post up that I have a few Animation Stations and a Koala pad for sale. If you know of anyone interested, or if you are, E-Mail me. I guess I'll try to post it up next time.

Jeff: The particular board must have been at its limit. I have to weed some boards every week. Others every month. Readers can Email FLYING FINGERS on LOADSTAR's BBS. I would include his number, but he specified Email.

From: GANDALF

Question...Is there a difference in non-subscriber access and subscriber access? I have been receiving Loadstar for 3-4 years now and is there a number from my LS envelope to tell you to verify my subscription, if it is at all needed? Please let me know. Thank you and hope to hear from you soon!!

Jeff: Our BBS gives LOADSTAR Subscribers nearly unlimited access to the BBS, allowing 99 calls at 99 minutes each per day. Non-subscriber access is 3 calls at 45 minutes per day.

From: THE FEZ

I just got LS #136 and had to tell y'all how great this issue is! I've (virtually) thumbd through it, and I have to say that I am impressed! Overload and Chordcentration are great games (by the way, I used to think that I had a good ear for notes -- I play saxophone, trumpet, tuba, flute, and just about every other wind instrument -- but after playing Chordcentration I might have to re-think that opinion!) The Namystics contest is just downright MEAN, but I'll try to beat it anyway. The Camcorder switch is something I might just try, but I won't blame y'all if I screw up. This issue even has recipes! After I'm through going over these disks I will definitely send in a Feedback response!

Kudos! Kudos! Kudos!

P.S.- Jeff, I think what you have done with LS Letter #26 is beautiful! Keep up the good work! Also, because of LS Letter #25 you prevented me from making a mistake - I saw the Star SJ-144 in Damark and was seriously considering buying it. Thanks for the consumer info!

Jeff: I have to admit that The SJ-144 was a disappointment, even when I hadn't paid a cent for it. I couldn't imagine dropping a couple of hundred hard-earned dinero for one only to find out that it wasn't even as good as an impact color printer.

Glad to hear that you approve of LOADSTAR, and glad to see that you frequent the LOADSTAR BBS.

Actually I was a little embarrassed of the LS Letter #27. I thought I went overboard with the graphics. A couple of things on side 1 were hard to read with the graphics in the background.

A graphic is a terrible thing to waste.



From The Compleat Walt Graphic Collection

HD Series SCSI Hard Disk Drives

HD-40, 42 MB (Limited Supply)	\$329.00
HD-85, 85 MB (Limited Supply)	\$359.00
HD-170, 170 MB (Special Edition)	\$399.00
HD-340, 340 MB (Special Edition)	\$449.00
HD-500, 500+ MB (Special Edition)	\$499.00
HD-1000, 1 GB (Special Edition)	\$779.00

FD Series 3.5" Floppy Disk Drives

FD-2000 (800K end 1.6 MB)	\$179.95
FD-4000 (800K, 1.6 MB and 3.2 MB)	\$249.95
FD Real-Time-Clock Option/Kit	\$20.00/\$29.00
Box of 10, High Density Disks (1.6MB)	\$14.95
Box of 10, Enhanced Density Disks (3.2 MB)	\$29.00

JiffyDOS

(Specify computer serial number and drive model)

JiffyDOS C64/SX-64 System	\$49.95
JiffyDOS C-128/128-D System	\$59.95
Additional Drive ROM's	\$24.95

Miscellaneous Hardware

80-column Monitors (Refurb)	CALL
Aprotek 3-Way User Port Expander	\$30.00
Aprotek User Port Extension Cable	\$19.00
C-64/C64-C Computers (Refurb, w/JD)	\$89.00
C-64, C-64C Power Supply (Repairable)	\$39.00
C-128 Power Supply (Repairable)	\$49.00
Cannon BJ-200ex Bubble Jet Printer	\$289.00
Cannon BJC-4000 Color Bubble Jet Printer	CALL
Commodore 1541 Disk Drives (NEW, w/JD)	\$119.00
Commodore 1541 Disk Drives (Refurb, w/JD)	\$75.00
Commodore 1541-II Disk Drive (Refurb, w/JD)	\$109.00
Commodore 1802 40-column Monitor (Refurb)	\$139.00
CMD EX2+1 3-Port Centridge Port Expander	\$34.95
CMD EX3 3-Port Centridge Port Expander	\$29.95
CMD Gamepad/Joystick Controller	\$24.95
CMD GeoCable II Print Cable 6ft./15ft.	\$29.00/\$34.00
CMD SmartMouse (1351 Compatible Mouse)	\$49.95
CMD SmartTrack (1351 Compatible Trackball) ..	\$69.95
Monitor Cables	CALL
Mouse Pad	\$2.95
MW-350 Printer Interface (20K/8K Buffer)	\$49.00/\$60.00
Samsung SP-0912 9-pin Epson-comp. Printer	\$139.00
Samsung SP-2412 24-pin Epson-comp. Printer ..	\$179.00
Samsung SP-2417 24-pin Color Printer	\$249.00

Utilities

Big Blue Reeder V4.10 (SOGWAP)	\$39.00
CMD Utilities	\$24.95
JiffyMON-64 (ML Monitor)	\$19.95
The Compression Kit '94 (Med Men)	\$39.00

GEOS

Collette Utilities (Hendy Geo Utilities)	\$19.95
Desk Pack Plus	\$29.00
Dweezils Greatest Hits (NewTools2, Stamp, Label28)	\$30.00
FONTPACK Plus	\$25.00
geteWay 64 or 128 (Specify Version)	\$29.95
geoBASIC	\$20.00
geoCalc 64/128	\$40.00/\$45.00
geoChart	\$29.00
geoFAX	\$39.95
geoFile 64/128	\$40.00/\$45.00
geoMekeBoot (Makes Bootable copies)	\$12.95
geoProgrammer	\$45.00
geoPublish	\$40.00
GEOS 64 v2.0	\$44.00
GEOS 128 v2.0	\$49.00
geoSHELL V2.2 (CLI for GEOS)	\$24.95
International FONTPACK	\$25.00
Perfect Print LQ for GEOS (Laser-like output) ..	\$49.95
RUN GEOS Companion	\$20.00
RUN GEOS Power Pak I or II (Specify)	\$20.00

Books

Anatomy of the 1541	\$12.00
Basic Compiler Design for the C-64	\$12.00
C-64 Science & Engineering	\$12.00
C128 Computer Aided Design	\$12.00
C128 BASIC Training Guide	\$12.00
Cassette Book for C-64 and Vic 20	\$12.00
Commodore 64 Tricks and Tips	\$12.00
GEOS Programmers Reference Guide	\$35.00
Graphics Book for the C-64	\$12.00
Hitchhikers Guide to GEOS	\$35.00
Ideas for Use on Your C-64	\$12.00
Printer Book for the C64	\$12.00
Mepping the C64	\$12.00
Simple Internet	\$18.95
Superbase - The Book	\$15.00

Scanning & Video

Handyscanner	\$249.00
Pegefox	\$139.00

RAMLink Power-Backed RAM Disk

RAMLink Base Model (0MB, No RAMCard)	\$149.00
RAMLink w/1 MB RAMCard (Limited Time)	\$199.00
RAMLink w/4 MB RAMCard (Limited Time)	\$339.00
RAMCard RTC Option/Kit	\$10.00/\$19.00
RAMLink Battery Back-up (Optional)	\$24.95
Parallel Cable (RAMLink to HD)	\$14.95

MIDI & Sound

Digimaster	\$34.95
SID Symphony Stereo Cartridge	\$44.95
Sonus 64 Sequencer, MIDI Interface, Cables	\$99.00
Sonus 128 Sequencer, MIDI Interface, Cables	\$99.00

Languages & Compilers

BASIC 64 Compiler (Abacus)	\$17.00
BASIC 128 Compiler (Abacus)	\$25.00
Blitz! 64 Compiler (Skyles)	\$30.00
Blitz! 128 Compiler (Skyles)	\$30.00
Buddy 64/128 Assembler	\$39.00
Cobol 64 (Abacus)	\$17.00
Fortren 64 (Abacus)	\$17.00
Pascal 64 (Abacus)	\$17.00
Power C 64 (Spinaker)	\$14.00

Productivity

Cadpak 64 (Abacus)	\$22.00
Cadpak 128 (Abacus)	\$25.00
Chertpek 64 (Abacus)	\$17.00
Chertpek 128 (Abacus)	\$25.00
1 Paint v1.5 (128, 80-col., 64K VDC) (Living Proof) ..	\$39.00
1 Port v1.54 (128, 80-col., 64K VDC) (Living Proof) ..	\$29.00
Outrageous Pages (Batteries Included)	\$19.00
PeperClip 3 84/128 (Batteries Included)	\$35.00
Personal Portfolio Manager (Abacus)	\$16.00
Pocket Writer 2 (64) (Digital Sol.)	\$65.00
Pocket Writer 3 (64 or 128) (Digital Sol.)	\$70.00
Pocket Planner 2 or Pocket Flier 2 (Digital Sol.) ..	\$35.00
PowerPlan 64 (Abacus)	\$16.00
RUN Productivity Pak I, II, or III (Specify)	\$15.00
RUN Super Starter Pak 1541 or 1581	\$20.00
RUN Works	\$20.00
SEC Check Register 128	\$29.00
SuperScript 64 (Precision)	\$15.00
SuperScript 128 (Precision)	\$20.00
Superbase 64 Version 3.01 (Precision)	\$35.00
Superbase 128 Version 3.01 (Precision)	\$35.00
SwiftCalc 64 (Timeworks)	\$16.00
Tex Perfect 64 (Free '94 Upgrade)	\$69.00
Tex Perfect 128 (Free '94 Upgrade)	\$79.00
TWS 64 w/Speller (Busy Bee)	\$29.00
TWS 128 w/Speller (Busy Bee)	\$39.00
TWS Modules (HD/RL/Illustrator)	each \$5.00

Telecommunications

Aprotek MiniModem C-24 (C= ready, 2400 baud)	\$69.00
Aprotek MiniModem C (C= ready, 1200 baud)	\$50.00
Aprotek Modem adapter (C= to Ext. PC Modem)	\$20.00
BOCA 2400 Beud Modem	\$69.00
BOCA 2400 w/SwiftLink end Cable	\$99.00
BOCA 14.4K bps FaxModem	\$129.00
BOCA 14.4K w/SwiftLink & Cable	\$159.00
BOCA V.34 28.8K bps FaxModem	\$259.00
BOCA V.34 w/SwiftLink & Cable	\$289.00
Dialogue 128	\$29.00
SpeedTerm (Abacus)	\$25.00
SwiftLink RS-232 Centridge (Up to 38.4K baud)	\$39.95
SwiftLink Modem Cable (DB9-DB25)	\$9.95

Games

Atomino	\$17.00
Bellatrix	\$13.00
Blood Money	\$15.00
Chompl	\$10.00
Day in the Life of Prehistoric Man	\$19.00
Escape Route	\$19.95
Heavenbound	\$19.95
Island of the Dragon	\$13.00
Leser Squad	\$13.00
Lions of the Universe	\$19.95
Meinframe	\$13.00
Mence	\$15.00
Navy Seal	\$10.00
Rings of Medusa	\$18.00
RUN C128 Funpak	\$15.00
RUN C64 Gamepak	\$15.00
Skate or Die	\$13.00
The Amazing Spider-Man	\$15.00
The President Is Missing!	\$10.00
The Three Stooges	\$10.00
Tie Break Tennis	\$16.00
Total Eclipse	\$10.00
Ultimate V	\$17.00
Wings of Circe	\$19.00
Wizardry 5: Heart of the Meelstrom	\$24.00

JiffyDOS

Increase Speed Up to 1500% while retaining 100% compatibility

- Speeds up Loading, Saving, Verifying, Formatting and Reading/ Writing of Program, Sequential, User and Relative files unlike cartridges which only speed up Loading and Saving of PRG files
- Built-in DOS Wedge plus 17 additional features including file copier, text dump, printer toggle, and redefinable function keys make using your computer easier and more convenient
- ROM upgrade installs easily into most computers and disk drives. Supports C-64, 64C, SX-64, C-128, 128-D, 1541, 1541C, 1541-II, 1571, 1581 and more.

FD Series

3.2 and 1.6 MB 3.5" Floppy Drives

The FD-2000 and FD-4000 disk drives utilize today's latest 3.5 inch disk drive technology. FD-2000's support 800K (1581 style) and 1.6 MB (High Density) formats, while the FD-4000 also offers support for the 3.2 MB (Enhanced Density) disk format. Fast and reliable, they support 1541, 1571 and 1581 style partitions, Native Mode partitioning and can actually read and write 1581 disks. FD's feature built-in JiffyDOS, SWAP button and optional Real Time Clock. High capacity, speed and compatibility make the FD right for every application, including GEOS.

RAMLink

Power-Backed Expandable REU

The fastest possible form of storage, RAMLink provides instant access to files and retains data while your computer is turned off. Easy to use and expandable up

to 16 MB, RAMLink utilizes the same powerful operating system found in CMD Hard Drives. Unlike Commodore REU's which are compatible with less than 1% of commercial software, RAMLink supports more than 80% of the commercial titles. RAMLink also offers built-in JiffyDOS Kernel, SWAP feature, reset button, enable/disable switch, pass-thru port and RAM port for REU/GEORAM use. RAMLink offers maximum speed, expandability and compatibility with all types of software and hardware including GEOS.

HD Series

SCSI Hard Drive for the C-64/128

HD Series Hard Drives are available in capacities up to 1 GB, are fully partitionable, and can emulate 1541, 1571, & 1581 disks while Native partitions utilize MS-DOS-style subdirectories. HD's connect easily to the serial bus or parallel via RAMLink. Includes built-in JiffyDOS, SWAP feature and RTC. HD's offer superior compatibility with most commercial software including BBS, Productivity and GEOS. And with new pricing, HD Series drives offer the lowest cost per megabyte of any C64/128 storage device.

Shipping and Handling Charges

Use the chart below to match your order subtotal with your shipping zone and method.

Order Subtotal	Continental United States					
	UPS Ground	2nd Day	Next Day	AK HI, PR	Canada	Foreign
\$0.01 - \$19.99	\$3.00	\$8.00	\$17.00	\$12.00	\$5.00	\$15.00
\$20.00-\$29.99	\$5.00	\$9.00	\$18.00	\$14.00	\$7.00	\$20.00
\$30.00-\$59.99	\$6.00	\$10.00	\$20.00	\$15.00	\$9.00	\$25.00
\$60.00-\$149.99	\$8.00	\$12.00	\$23.00	\$19.00	\$12.00	\$35.00
\$150.00-\$299.99	\$10.00	\$14.00	\$27.00	\$21.00	\$20.00	\$50.00
\$300.00-\$799.99	\$15.00	\$20.00	\$34.00	\$27.00	\$25.00	\$55.00
\$800.00 +	\$20.00	\$25.00	\$40.00	\$32.00	\$35.00	\$60.00

UPS C.O.D. add \$5.00 (U.S./PR only)

Payment and Delivery: CMD accepts MC, Visa, Money Orders, COD and Personal Checks. Personal Checks are held for up to 3 weeks. Most items are stock, contact CMD for current delivery schedules. Returns for merchandise credit only within 30 days with prior authorizations. All prices and specifications are subject to change without notice.



Creative Micro Designs, Inc.

P.O. Box 646
East Longmeadow, MA 01028

Info: (413) 525-0023
Fax: (413) 525-0147